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SENIOR SECONDARY SCHOOL STUDENTS' PERCEPTION OF SMART CLASSROOM: ATTITUDE AND CHALLENGES

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ABSTRACT

A smart classroom is a classroom with enhanced educational technology that uses audio, video, animations, graphics, and other multimedia to improve teaching and learning for both teachers and students. This study adopted a descriptive survey research designed to investigate senior secondary school students' attitude towards the use of smart classroom in Lagos State. The population of the study was 40 senior secondary school students in Greenspring Schools Awoyaya and 38 senior secondary school students in New Hall International School, Lagos State, Nigeria. A sample of 50 students was used from two secondary schools in Lagos, Nigeria. A simple random sampling technique was used for the study. The instrument used in this study to collect data from respondents was a structured questionnaire constructed by the researcher based on the four-point Likert scale. Face and content validity of the structured questionnaires was used for the study**.** The reliability coefficient was estimated using Pearson Product Moment Correlation and 0.74 was obtained. Mean and Standard Deviation were used to answer the research questions while t test was used to answer the hypotheses. The study found that smart classrooms can even interact with the visuals utilizing cutting-edge technology like virtual reality; they also increase teaching and learning flexibility and improve the in-class experience for students. It was recommended that Teachers should employ smart classrooms to simplify data storage, gathering, processing, and analysis for the best pedagogical decisions.

Keywords: Smart classroom, educational technology, information, flexibility, connectivity, personalization.

I INTRODUCTION

A smart classroom is a classroom with enhanced educational technology that uses audio, video, animations, graphics, and other multimedia to improve teaching and learning for both teachers and students. This raises the level of involvement and results in children performing better. This strategy has been quite effective, especially when students find it difficult to focus in an online environment. Smart classroom technology increases student engagement Manasa [1].

According to Tuncay [2], a smart class enables students to process material, acquire background knowledge, and apply their learning. To support students in developing intentional and advanced learning, numerous assessments are incorporated into the smart class process. Smart classes can be described as virtual classrooms. A smart classroom has the following features: Hardware (Desktops, laptops, tablets, and iPads) LCD Projectors DVD/VCR Combo Interactive Whiteboards Microphones.

According to Xian [3], a smart classroom ought to contain the following features:

• Learning management system • Interactive control center • Interactive displays • Response pad • On-demand collaboration • Interactive whiteboards • Classroom control system

A smart or digital classroom fosters creativity, and an interactive environment will inspire students to come up with more creative ideas, questions, and solutions, according to Thilagavathy & Bala [4]. A smart class's goals are as follows:

• Creating a smart class module that enables students to visualize an idea with unforgettable images and animations in accordance with the school's curriculum

• Allowing teachers to voice their opinions and ensuring that every student comprehends the teachings being taught

• Improving kids' performance and helping teachers tackle new difficulties.

• Teaching both local and distant pupils at the same time.

The goals of a smart classroom, according to Akshay [5], are to give teachers access to multimedia information, pedagogically sound curricular resources, and visually rich curriculum materials that may be used for effectively educating pupils. By holding interactive, live teaching sessions, explaining and contrasting various objects and perceptions with regard to particular concepts, and visualizing the concepts and practicing with models and demonstrations, it is possible to ensure that lessons are easily understood and that abstract concepts become real.

Smart classes for schools can be divided into three groups, per Singh & Thakur [6]:

- Basic smart classrooms are those having projectors, computers, laptops, screens for viewing, and similar technology. • Intermediate smart classes: classrooms with modest control panels, a small podium, and basic smart classes.

Smart classes with advanced features include everything from beginner-level to intermediate-level classes' equipment.

A "smart classroom" is one that makes use of technology to improve the educational process. Computers, tablets, and other digital tools, interactive whiteboards, and other teaching aids might be used in this. A smart classroom aims to give pupils a more productive and engaging learning environment. Teachers can design more interactive and engaging lesson plans by utilizing technology. Additionally, collaborative learning and hands-on learning are frequently more prevalent in smart classrooms. Teachers may also find this to be a useful tool as it makes it simple for them to find resources for their lesson plans:

* Time-saving technology: a collection of technologies that help teachers run their classrooms more effectively and save time on repetitive work. Teachers can organize and deliver courses more successfully with the aid of classroom management software and online resources. These time-saving tools can give teachers more time to concentrate on more crucial tasks like teaching.

* Enhanced productivity: The smart classroom is built to support heightened productivity by utilizing technology. A computer, projector, and other technology tools are available in the classroom to help students and teachers communicate with the content and with each other more effectively and efficiently.

Demir [8] asserts that the smart education framework may adequately characterize the smart education system. According to Yan & Yuhua [9], inhabited spaces that offer the most opportunity for people to connect, engage, support, and challenge one another to learn are the brightest learning settings. In accordance with the learner's model and learning scenario, a smart learning environment can offer individualized resources and tools for learning, hence facilitating successful learning, claim Ronghuai, Junfeng, and Lanqin [10]. It may identify several aspects of a learning scenario, such as the time, location, peers, and activities involved in learning. Recognizing learning contexts supports instructional activities. The following, according to Sharma & Kaur [11], are the tenets of a smart classroom:

• Flexibility: The layout and design must accommodate all of the various personalities and learning styles.

• Adaptability: the classroom and the technologies used to support education must be able to meet a variety of unique educational needs.

• Comfort: Both physical and mental health must be taken into account during the learning process.

Environmental factors must be managed and regulated in every location.

• Diversity: Enough resources must be available to support a diverse diversity of educational initiatives and learning opportunities.

• Connectivity: Devices must be able to quickly and easily establish high-quality connections when connecting to the internet.

• Personalization: Students must relate to and identify with the environment and its various dynamics. Their personal items must have a place to be stored.

• Organization: To improve the use, accessibility, and functioning of the spaces' resources and elements, there must be criteria, tactics, and options available.

• Openness: in order to provide for visible and physical access from indoors to outside and vice versa, the arrangement and structure must be accessible to the outside world and other areas. Links to the outer world must exist.

• Sustainability: the spaces must be built to promote sustainability and recycling, and utilize non-contaminating, sustainable, ecologically friendly raw materials. Everyone must feel comfortable and secure when utilizing the spaces and the items they contain. Naidu and Karunanayake [12]

II STATEMENT OF THE STUDY

The main justification for using technology in the classroom is that developing students should be able to apply what they learn in the classroom to their daily lives, and since technology permeates so much of modern life, it is only natural that students would be adept at using devices like laptops, smartphones, and tablets. By eliminating technology from the learning process, pupils' skills would be significantly diminished. Similarly, even if the pupils lack technological proficiency, this is still a good reason to embrace the talent. It's getting more and more crucial to understand technology in the industry, education, and other settings; In order to compete with peers in the twenty-first century, technological skill is simply required. However, issues with technology can also provide a barrier for educational institutions. The necessity for technological skill is simply a requirement of competing with peers in the twenty-first century. But issues with technology can also pose difficulties for educational institutions.

Aim and purpose of the study

The study's goal is to learn more about how senior secondary school students view smart classrooms, including their attitudes and obstacles. The study specifically aims to:

1. Ascertain senior secondary school students' attitudes toward the deployment of smart classrooms in Lagos State

2. Investigate the effects of smart classrooms on pupils in senior secondary schools in Lagos State.

3. Describe the difficulties senior secondary school pupils encounter while learning in smart classrooms.

Research Questions

The following research questions were formulated in accordance with the study's purpose and objectives;

1. How do senior secondary school pupils in Lagos State feel about using smart classrooms?

2. What are the effects of smart classrooms on seniors in Lagos State?

3. What difficulties do senior secondary school pupils in Lagos State confront when using smart classrooms?

Hypotheses

The following research hypotheses are put out in light of the study's unique aims and research questions:

HO1: There is no discernible difference between the attitudes of the students at Greensprings School Awoyaya and New Hall International School about the use of smart classrooms.

HO2: The effects of smart classrooms at Greenspring schools Awoyaya and New Hall International School are similar.

HO3: The obstacles to implementing smart classrooms at New Hall International School and Greensprings School Awoyaya are similar in scope.

III MATERIAL AND METHODS AND RESULTS

This study adopted a descriptive survey research designed to investigate senior secondary school students' attitude towards the use of smart classroom in Lagos State. The population of the study was 40 senior secondary school students in Greenspring Schools Awoyaya and 38 senior secondary school students in New Hall International School, Lagos State, Nigeria. A sample of 50 students was used from two secondary schools in Lagos, Nigeria. A simple random sampling technique was used for the study. The instrument used in this study to collect data from respondents was a structured questionnaire constructed by the researcher based on the four-point Likert scale. Face and content validity of the structured questionnaires was used for the study**.** The reliability coefficient was estimated using Pearson Product Moment Correlation and 0.74 was obtained. Mean and Standard Deviation were used to answer the research questions while t test was used to answer the hypotheses.

Research Question 1: What are senior secondary school students in Lagos State's attitudes regarding using smart classrooms?

Table 1: Students' perceptions of smart classrooms

S/N	Items Attitude of students towards smart classroom	SA	A	SD	D	Mean	SD	Total
1	With the use of texting, forums, and mobile notifications, the smart classroom makes it simple to communicate with students.	40	10	-	-	3.80	0.40	50
2	Visual learning is said to be very successful and makes it easier for students to understand concepts when using sophisticated technology aspects like pictures, graphs, flow charts, and movies.	45	5	-	-	3.90	0.28	50
3	Because there are less distractions in a smart classroom, pupils can focus better and remember more knowledge.	30	20	-	-	3.60	0.48	50
4	With the use of digital technology, a smart classroom helps teachers to impart knowledge in a way that is more engaging and simple for pupils to absorb.	32	18	-	-	3.64	0.48	50
5	A smart classroom is a successful strategy for sustainability since it eliminates a significant amount of paperwork, paving the way for greener schools.	27	23	-	-	3.54	0.49	50
6	Smart classroom technology speeds up the traditional learning process by enabling students to present online and get feedback from their lecturers.	42	8	-	-	3.84	0.36	50
7	A smart classroom boosts output	48	1	1	-	3.94	0.31	50
8	Environmentally friendly environment is improved through smart classroom	47	3	-	-	3.94	0.23	50
9	With the aid of technology, smart classes in schools give pupils a superior educational experience.	41	5	4	-	3.74	0.59	50
10	The development of children' minds and bodies is improved by smart classrooms.	46	4	-	-	3.92	0.27	50
	Average Mean					3.74	0.38	

Students' attitudes on the use of smart classrooms are shown in Table 1 by their acceptance of the complete mean item. The item mean is greater than the 2.50 criteria mean. Table No. 1 so showed that smart classrooms enhance students' mental and physical development, improve the environment, and increase production.

Research Question2: How do smart classrooms in Lagos State affect students in senior secondary schools?

Table 2: Impact of the smart classroom on pupils

S/N	Items Impact of Smart Classrooms on Students	SA	A	SD	D	Mean	SD	Total
1	The textbook/notebook is largely or entirely eliminated by the usage of smart devices in education.	33	10	7	-	3.52	0.72	50
2	Visuals are used in smart classrooms for instruction.	20	25	5	-	3.30	0.64	50
3	A smart classroom may make learning simple for pupils.	37	13	-	-	3.74	0.43	50
4	Using cutting-edge technology like virtual reality, smart classrooms can even interact with the images.	44	5	1	-	3.86	0.40	50
5	A smart classroom can provide flexibility in instruction.	48	2	-	-	3.84	0.22	50
6	You can download and watch digital study materials anywhere at any time.	36	14	-	-	3.72	0.44	50
7	Students typically progress at their own rate.	26	24	-	-	3.52	0.49	50
8	Smart classrooms are accessible and simple to use.	35	14	1	-	3.68	0.50	50
9	Students' academic performance is improved by smart classrooms.	42	5	3	-	3.78	0.54	50
10	gives students a better experience in the classroom	42	8	-	-	3.84	0.36	50
	Average Mean					**3.68**	**0.44**	

Table 2 demonstrates that students recognized the full mean item as a result of the smart classroom. The item mean is greater than the 2.50 criteria mean. Thus, table no. 2 demonstrated that a smart classroom may enhance flexibility in teaching and learning while also giving students a better in-class experience. It can even interact with the visuals utilizing cutting-edge technology like virtual reality.

Research Question 3: What difficulties do senior secondary school pupils in Lagos State have when using smart classrooms?

Table 3: Smart classroom challenges

S/N	Items Challenges of smart classroom	SA	A	SD	D	Mean	SD	Total
1	Numerous smart devices, including laptops, tablets, projectors, software, etc., are required for a smart classroom.	49	1	-	-	3.98	0.14	50
2	When technology advances, software and hardware requirements also change often.	40	8	2	-	3.76	0.51	50
3	Schools may need to engage a technology specialist to keep up with the advancements and changes in these software, which is an additional expense that schools must incur.	30	10	10	-	3.40	0.80	50
4	Technical issues are common with electronic devices.	45	3	2	-	3.86	0.44	50
5	Electronic equipment frequently have technical problems.	40	7	3	-	3.74	0.55	50
6	There are not enough qualified teachers.	31	19	-	-	3.62	0.48	50
7	It's challenging to produce presentations, movies, and programs.	21	29	-	-	3.42	0.49	50
8	expensive and challenging to implement	39	11	-	-	3.78	0.41	50
9	High maintenance cost	32	18	-	-	3.64	0.48	50
10	Highly dependent on electricity	40	10	-	-	3.80	0.40	50
	Average Mean					**3.70**	**0.49**	

According to Table 3, students acknowledged the entire mean item as one of the difficulties associated with using a smart classroom. The item mean is greater than the 2.50 criteria mean. Thus, table no. 3 showed that a smart classroom requires a variety of smart devices, including computers, tablets, projectors, and software. Electronic devices, however, are prone to technical problems and depend heavily on electricity.

Hypotheses

HO1: There is no discernible difference between the attitudes of students toward the usage of smart classrooms at New Hall International School and Greensprings School Awoyaya.

Table 4 of analysis in order to compare student attitudes on the usage of smart classrooms at Greensprings School Awoyaya and New Hall International School.

Group	Mean	Sum of Squared Deviation	N	Df	Standard Error	t(Cal)	t(tab)	Decision
Greensprings School Awoyaya	3.09	5.30	11	20	0.92	0.09	2.10	Accepted
New Hall International School.	3.00	8.00	11					

HO is Accepted because the computed value of t is less than the tabular value (t(Cal) ttable). This indicates that Greenspring School Awoyay and New Hall International School's performances are identical by coincidence. Their

mean performance does not differ significantly. British Greenspring School Awoyaya (3.09) and New Hall International School (3.00) both have the same difference.

HO2: The effects of smart classrooms at Greenspring schools Awoyaya and New Hall International School are similar.

Table 5 of analysis to compare the effects of smart classrooms at Greenspring School Awoyaya and New Hall International School.

Group	Mean	Sum of Squared Deviation	N	Df	Standard Error	t(Cal)	t(tab)	Decision
Greenspring school Awoyaya	6.4	100.56	11	20	5.72	0.40	2.10	Accepted
New Hall International School	4.3	10.19	11					

HO is Accepted because the computed value of t is less than the tabular value ($t_{(Cal)} < t_{table}$). This indicates that New Hall International School and Greenspring School Awoyaya both performed equally well. Their mean performance does not differ significantly. Chance accounts for the small discrepancy between Greenspring School Awoyaya (6.4) and New Hall International School (4.3).

HO3: The difficulties in implementing a smart classroom at Greensprings School Awoyaya and New Hall International School are similar.

Table 6 of analysis to compare the difficulties in implementing smart classrooms at Greenspring schools Awoyaya and New Hall International School.

Group	Mean	Sum of Squared Deviation	N	Df	Standard Error	t(Cal)	t(tab)	Decision
Greenspring School Awoyaya	2.4	12.6	11	20	1.45	0.07	2.10	Accepted
New Hall International School	2.5	12.8	11					

HO is Accepted because the computed value of t is less than the tabular value (t(Cal) ttable). This indicates that New Hall International School and Greenspring School Awoyaya both performed equally well. Their mean performance does not differ significantly. Chance accounts for the small discrepancy between Greenspring School Awoyaya (2.4) and New Hall International School (2.5).

IV DISCUSSION

Research Question 1: What are senior secondary school pupils' attitudes on the usage of smart classrooms in Lagos State?

According to the report, smart classrooms can even interact with the images using cutting-edge technology like virtual reality. They also increase teaching and learning flexibility and improve the in-class experience for students.

The findings of the current study concur with those of Samapika [13], who discovered that technology has made a plethora of knowledge available to pupils in today's environment. Any sort of learner, whether gifted or impaired, can locate and use the essential materials to acquire knowledge because information is virtually always available in every conceivable

fashion. The study supports the findings of Seuk, Seuk, Sedigheh, and Ainin [14], who showed that pupils responded well to student-centered learning and smart classrooms that included technology. In order to make learning more engaging, appealing, and understandable as well as to give students opportunity to explore and discover new topics, smart classrooms assist educators.

Research Question 2: How do smart classrooms in Lagos State affect students in senior secondary schools?

According to the report, smart classrooms can even interact with the images using cutting-edge technology like virtual reality. They also increase teaching and learning flexibility and improve the in-class experience for students. The results of the current study are consistent with those of Bachitra & Ahrar [15], who discovered that smart classes are more effective than traditional ones for teaching students and that their achievement levels are higher. Because an interactive white board engages all three senses—sight, sound, and touch—students learn most effectively through these senses.

The findings of the study support those of Jena [16], who discovered that pupils taught using smart classes outperformed those taught using standard methods in terms of academic attainment. The arrangement of the remedial exercises and the distribution of praise for every improvement made possible by smart class learning.

Research Question 3: What difficulties do senior secondary school pupils in Lagos State have when using smart classrooms?

According to the current study, a smart classroom requires a variety of smart devices, including laptops, tablets, projectors, and software. Electronic devices are more prone to malfunction and are more dependent on electricity.

The results of the study are in agreement with those of Eleni & Andreas [17], who discovered that the inclusion of artificial intelligence in smart classrooms was a result of the quick development of technology and the necessity to design more effective and innovative classes that support both in-class and remote activities. The study supports the findings of Chhaya & Ravindra [18], who discovered that the use of educational technology improves skills and cognitive traits. With the aid of new technology, learning and receiving new information have never been more explosive, especially on smart classroom devices.

V CONCLUSIONS

The interactive educational technology tools found in smart courses enable students to learn, collaborate, and innovate in amazing ways while meeting the needs of every learner. Therefore, the study discovered that smart classrooms enhance students' mental and physical development, improve the environment, and increase productivity. It was discovered that smart classrooms can even interact with the visuals utilizing cutting-edge technology like virtual reality; they also increase teaching and learning flexibility and improve the in-class experience for students. Additionally, a smart classroom requires a variety of smart devices, such as laptops, tablets, projectors, and software. Electronic devices are more prone to technical issues and depend heavily on power.

VI RECOMMENDATIONS

The researcher makes the following recommendations based on the study's findings:

1. Teachers should employ smart classrooms to simplify data storage, gathering, processing, and analysis for the best pedagogical decisions.

2. The current educational system needs to promote the use of smart classrooms.

3. Smart classrooms and e-learning can be utilized to teach new skills in novel ways.

REFERENCES

[1] Manasa, R., (2023). 'Is smart classroom concept enough to combat the ongoing crisis', https://leadschool.in/blog/is-smart-classroom-concept-enough-to-combat-ongoing-crisis/

[2] Tuncay, S., 'Future's learning environments in health education: The effects of smart classroom on the academic achievement of the students at Health College'.. *Journal of telematics and informatics.* 27(2010), 314-322.

[3] Xian, L., 'Physical educatity on curriculum and physical education model based on smart

classroom and mobile computing', Wireless communications and mobile computing. spl.issue, (2022)1-9

[4] Thilagavathy, T., & Bala, S.A., 'Education high school students' attitude towards the use of smart-classroom', *International journal of research special issue on recent trend in science*.4(2017), 22-28.

[5] Akshay, S., (2023). 'Features of smart classroom' https://leadschool.in/blog/elements-of-smart-class-that-change-a-schools-dynamics/..

[6] Singh, R., & Thakur, A. 'A review on smart classrooms', International Journal of Engineering and Information Systems (IJEAIS), 1(2017), 61-67.

[7] Zhang, Y., Zhou, L., Briggs, R. O., & Nunamaker Jr, J. F. 'Students' attitudes towards smart classroom technology: A case study in China', Computers & Education, 116, (2018)38-50.

[8] Demir, K.A., . 'Smart education framework', *Smart learning environment.* 8(2021) 30-41.

[9] Yan, L., & Yuhua, G., 'Research on the strategy of smart classroom construction based on teachers' data literacy', SHS Web of conferences 123, 2021.

[10] Ronghuai, H., Junfeng, Y., & Lanqin, Z., The components and functions of smart learning environments, for easy, engaged and effective learning. *International journal for educational media and technology.* 7(2013), 4-14.

[11] Sharma, P., & Kaur, M. 'A study on effectiveness of smart classrooms in tertiary education'. International Journal of Applied Engineering Research, 11(2016), 5347-5351.

[12] Karunanayaka, S. P., & Naidu, S. 'Exploring the benefits of smart classrooms for teaching and learning in higher education', Journal of Education and Practice, 9(2018), 14-22.

[13] Samapika, D., 'Smart classroom for modern education', *International journal of English learning and teaching skills.* 2(2022), 1-18.

[14] Seuk, Y.P., Seuk, W.P., Sedigheh, M., & Ainin, S., 'Effect of smart classroom on student achievement at higher education', *Journal of educational technology system.* 3(2019),1-14.

[15] Bichitra, C., & Ahrar, H., 'Impact of smart class on academic achievement of Government aided secondary school learners of south Delhi', *International journal for innovative research in multidisciplinary field.* 3(2017), 561-565.

[16] Jena, P.C., 'Effect of smart classroom learning environment on academic achievement of high achievers and low achievers in science', *International letters of social and humanistic sciences.* 3(2013), 1-9.

[17] Eleni, d., & Andreas, L., 'A critical evaluation, challenges and future perspectives of using artificial intelligence and emerging technologies in smart classroom', *International journal of smart learning environments.* 10(2023), 15-30.

[18] Chhaya, A.K., & Ravindra, D.S., 'Advantages and challenges of using digital technologies in the classroom', *International Journal of science and research.* 7(2017), 1-4.